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## THE NORTHERN FUR-SEAL PROBLEM AS A TYPE OF MANY PROBLEMS OF MARINE ZOOLOGY

By Dr. BARTON WARREN EVERMANN,

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THERE are in the North Pacific three closely related species of fur seals. One of these, known as the Japanese fur seal (*Callorhinus kurilensis*), has its rookeries chiefly on Robben Reef, in the Okhotsk Sea, with still smaller rookeries on one or more of the Kuril Islands. These constitute the Japanese fur-seal herd, which is the smallest of any. It is said this herd in 1911, contained but 6,557 seals. The second species has its breeding grounds on Bering and Copper Islands of the Commander Group off the coast of Kamchatka. This species (*Callorhinus ursinus*), constitutes the Russian fur-seal herd which, in 1911 contained between 18,000 and 30,000 seals. The third species is the Alaska fur seal (*Callorhinus alascensis*), whose breeding grounds are on the islands of St. George and St. Paul of the Pribilof Group in Bering Sea, about 200 miles from the nearest point on the mainland of Alaska. This species constitutes the Alaska or American fur-seal herd which, according to the census of 1911, contained 127,745 seals. The Alaska fur-seal herd is not only much larger than both of the other herds combined, but the fur is regarded as superior.

### RUSSIAN CONTROL OF THE ALASKA FUR-SEAL ISLANDS

The Pribilof Islands, the only land on which the Alaska fur seals ever haul out for any purpose, were discovered in 1786, by Gehrman Pribilof, who for three years or more had been exploring Bering Sea in the interest of a Russian fur company. He at once took possession of the islands in the name of Russia. For the next thirteen years the islands were exploited by various rival companies. There was no thought of conservation, with the result that the herd was almost destroyed by 1798. In 1799, the Pribilof Islands, together with all the rest of Alaska, passed into the hands of the Russian-American Company. This company carried on the sealing business with autocratic power and with slight appreciation of the necessity of avoiding methods calculated to bring about the extinction of the herd, until in 1867, when Alaska was purchased from Russia by



IN AUGUST AND SEPTEMBER THE PUPS ARE OFTEN SEEN IN THE WATER ABOUT THE SEAL ISLANDS, LEARNING TO SWIM, THUS PREPARING FOR THE LIFE IN THE OCEAN WHICH THEY WILL LEAD FOR THE GREATER PART OF THEIR LIVES. THIS IS A SCENE OFF POLOVINA CLIFFS IN AUGUST, 1916. PHOTO BY HANNA.

the United States. In the season of 1868, the first of American occupation, two rival companies killed seals on the islands in the most reckless manner. The Congress then made the seal islands a government reservation and during the season of 1869, the killing was conducted under the direction of the Treasury Department. Then the islands were leased for a term of twenty years beginning in 1870, to the Alaska Commercial Company. This company was given the exclusive privilege, under the direction of the Treasury Department, of killing seals on the islands. The essential features of this lease were: (1) No female seals to be killed, (2) no male seals under one year old to be killed, (3) the killings after August to be limited to supplying food to the natives, (4) the total number to be killed in any one year not to exceed 100,000.

Upon the expiration of this lease the islands were again leased on March 12, 1890, but to a new concern, the North American Commercial Company. The lease was again for a period of twenty years and differed from the old lease chiefly in that no quota was fixed, except for the year 1890, when it was not to exceed 60,000, and the revenue derived by the government was \$10.22½ per skin as against \$3.17½ under the first lease.

Under these leases the companies were permitted to kill seals only on the land; they were not permitted to kill seals in the ocean.

#### KILLING SEALS ON THE LAND

The number of seals in the American herd when it came into the possession of the United States was very great; in 1873 it was estimated at 4,700,000. This number is undoubtedly very much too great; probably half that number would be a very liberal estimate. At any rate, it is quite certain that an annual kill of 100,000 young male seals could then be made without in the least endangering the herd.

So long as the killing was confined to the land it was easy so to regulate the killing as to permit an annual take of 100,000 young males and yet maintain the herd at a high degree of productivity; in other words, the annual kill of 100,000 young male seals would be made good by a net increase of at least 100,000 young males reaching the killing age each year.

#### HABITS OF THE FUR SEAL

The fur seal is highly polygamous, living in the ocean the greater part of its life, and coming out upon the land only during the breeding season, which is in the summer from June

until in the fall. The breeding males are called *bulls*; the breeding females are called *cows*; the young are called *pups*; young, non-breeding males (from one to five or six years old) are called *holluschiekie*, or *bachelors*. As the breeding season approaches the breeding seals begin landing upon the islands. With them come the bachelors, especially those more than one year old. The old bulls haul out first, each taking up a favorable position on shore and capturing as they land and holding in his harem as many cows as he can control. The number of cows in a harem may range from one to one hundred, the number varying with the abundance of bulls. The harem of average size under proper regulations will contain perhaps twenty-five to forty cows. Besides the breeding bulls there will usually be a varying number of half bulls, surplus bulls or waiting bulls, ready to become harem masters whenever opportunity offers. The number of surplus bulls will be few if the annual killings for the past few years have been excessive, or they will be many if the annual killings have not been large enough. Careful regulation of the killings is therefore essential to keep the number of surplus bulls within safe limits.

During the breeding season, the old males remain constantly on shore, never leaving the land until late in the fall. The cows, after their pups have been born, make frequent trips out in the ocean, often going 100 to 250 miles from the islands, to their feeding grounds. The younger bachelors also return to the water from time to time.

It is thought that the majority of young seals under two years of age, both males and females, remain in the water until in the fall, and come out on the land in force only when two years of age or older.

In the fall of the year, after the breeding season is over and the pups have learned to swim, the entire herd leaves the land and takes to the sea. In the winter they go as far south as off the southern California coast. Their migration route has been only roughly determined. In the spring they return to the islands. During this return they appear in numbers off the coasts of Washington and British Columbia, in the Gulf of Alaska and in the passes among the Aleutian Islands. During this return migration the cows are heavy with young and spend much time sleeping on the surface of the water. Each cow produces a single pup, which is born within a few days after she reaches the islands. She is served by the bull within a few days after her pup is born; the period of gestation is therefore only a few days short of one full year.

## PELAGIC SEALING

As already stated, so long as seals were killed only on the land it was possible to regulate the killing in such a way as to maintain the herd at its maximum size and productivity. The essential regulations would be: (1) Kill no females; save them all for breeding purposes. (2) Of the natural annual increment of commercially desirable young males (say those from three to five years of age), kill all except such number as may be needed to provide the necessary number of bulls each succeeding year. This number can be determined very exactly through carefully conducted scientific investigation.

During the forty years of leasing the killing on the land, although carried on without any intelligent understanding of the principles involved and in almost total ignorance of a number of the most important facts in the life history of the fur seal, was, in the main, conservative and not seriously detrimental to the herd. But in the last years of the lease of the Alaska Commercial Company, in the late eighty's, a new factor was introduced. Certain persons, chiefly Canadians of Victoria, British Columbia, discovered that the hunting of seals in the ocean could be carried on with profit. They found that, by falling in with the seal herd in the late winter and early spring off the coast of Washington, British Columbia and southeast Alaska, during the spring migration back to the Pribilof Islands, and again with the mother seals in Bering Sea in summer and fall when they visit their feeding grounds, large numbers of seals could be killed and the business of pelagic sealing, as it was called, made very profitable.

Following this discovery, the growth of the pelagic sealing industry was very rapid and the herd diminished correspondingly.

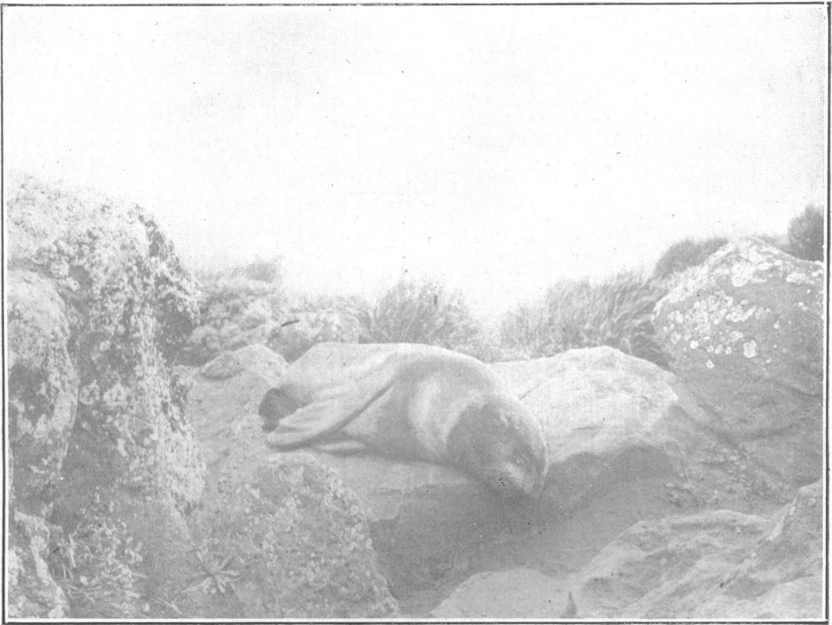
On the land, the killing can be, and was, selective; only surplus or unnecessary males were killed. No such selection is possible in pelagic sealing, even if the hunter were disposed to select, which he never was. When the hunter sees a seal in the water he can not tell whether it is a female or a male, so he tries to get every seal he sees. Of those he kills or mortally wounds, he probably does not recover more than one in five; some put the ratio at one in ten. On the basis of five to one, the number of seals killed outright or whose death was caused by the pelagic sealers from 1890 to 1897, has been computed to have been 1,907,217 males, 3,814,434 females, or a total of 5,721,651 seals. The total number killed on land during the same period on the Japanese, Russian and Pribilof Islands was: females, none; males, 350,268; from which it is easy to understand the cause

of the rapid decrease of the fur-seal herd during the last decades of the nineteenth century.

#### THE MODUS VIVENDI OF 1891 TO 1893

The disastrous results of pelagic sealing had become so evident that the governments of the United States and Great Britain agreed upon a *modus vivendi* on June 15, 1891.

The essential terms of this *modus vivendi* were that it closed the eastern part of Bering Sea to pelagic sealing so far as the subjects of the United States and Great Britain were concerned and limited the killings on our islands to 7,500 annually—the number required by the natives for food. The agreement was put into effect too late to do any good in 1891, even if it were



SLEEPING BACHELOR SEAL.

Tolstoi Rookery, St. Paul Island, July 21, 1892. Photo by Evermann.

possible for it to have done so; the pelagic fleet had already entered Bering Sea and begun killing seals, and when warned out of the protected area, they crossed over to the western part and continued their killing, which proved so profitable that the number of boats actually increased next year.

The agreement, originally made for one year, was extended to cover the seasons of 1892 and 1893.

#### TREATY OF FEBRUARY 29, 1892

As contemplated by the *modus vivendi*, a treaty was entered into between the United States and Great Britain February 29,

1892, the essential provisions of which were: (1) The appointment of a commission to make investigations concerning the habits of the fur seal, pelagic sealing, and the management of the herd on the islands, and (2) the reference of all matters in dispute to a tribunal of arbitration.

#### THE PARIS TRIBUNAL

This tribunal, consisting of seven arbitrators, met in Paris in February, 1893, and concluded its labors on August 15, following.

The American contention, as presented to the tribunal, was, in brief, that the decline in the herd was due solely to pelagic sealing; that pelagic sealing was indiscriminate, the kill consisting chiefly of females heavy with young or of mother seals with nursing young on the islands. The British contention was that the proportion of females in the pelagic catch was inconsiderable and that excessive killing on the land was the sole cause of the decline in the herd.

It is interesting to note that of the five questions in dispute submitted to the Paris Tribunal four were decided against the United States, and the remaining one was of no importance!

The tribunal then drew up a set of regulations, in nine articles, which the two governments agreed to observe. The only one of these regulations that is of primary importance is the first, which prohibited the subjects of Great Britain and the United States from killing seals in Bering Sea within a zone of sixty miles radius around the Pribilof Islands; and this, as well as all the other regulations established by the tribunal, was utterly useless in protecting the fur seal.

As previously stated in this paper, the cow seals during the breeding season go 100 to 250 miles from the Pribilof Islands to find suitable feeding grounds; indeed, practically all their feeding grounds are now known to lie well outside the sixty-mile zone.

The result was that pelagic sealing went merrily on so far as Canada was concerned, but the United States on December 29, 1897, passed a law making it unlawful for any of its citizens to engage in pelagic sealing at any time or in any waters, thus putting squarely upon the British and such other nations as might engage in pelagic sealing the entire responsibility for such results as might follow from killing seals in the open sea.

#### FAILURE OF THE PARIS REGULATIONS

The Paris regulations proved therefore almost utterly useless in protecting the fur seal. In the first place, only the United States and Great Britain were bound by the regulations. Other nations that were interested and wanted to be parties to



the treaty, for example Japan, but which were refused, were not bound by the regulations. They had a perfect right to kill seals anywhere on the high seas outside the three-mile limit, and Japan was quick to exercise that right. That country entered the field at once. Not being a party to the treaty of 1892, Japan was not bound by the Paris Tribunal regulations.



A MOTHER FUR SEAL AND HER PUP.

She could lawfully kill seals anywhere on the high seas, right up to the three-mile limit around the seal islands.

They did so, and found the business quite profitable. So destructive was pelagic sealing under the Paris Tribunal regulations that the herd, by 1911, had been reduced to a mere remnant of 127,745 seals all told, in spite of the fact that killing on the land fell from 30,654 in 1896 to 12,006 in 1911.

#### UNITED STATES ABANDONS LEASING SYSTEM

At the close of the period for which the islands had been leased to the North American Commercial Company for sealing

purposes, the United States decided to discontinue the leasing system. This action was taken by Congress April 21, 1910, upon the recommendation of Hon. Charles Nagel, then Secretary of Commerce, and Hon. Geo. M. Bowers, Commissioner of Fisheries. It provided that all sealing should hereafter be done by the government and the skins taken to be sold by the government to the best advantage. Beginning, therefore, with the season of 1910, the sealing on the Pribilof Islands has been carried on directly by the government.

#### TREATY OF DECEMBER 15, 1911

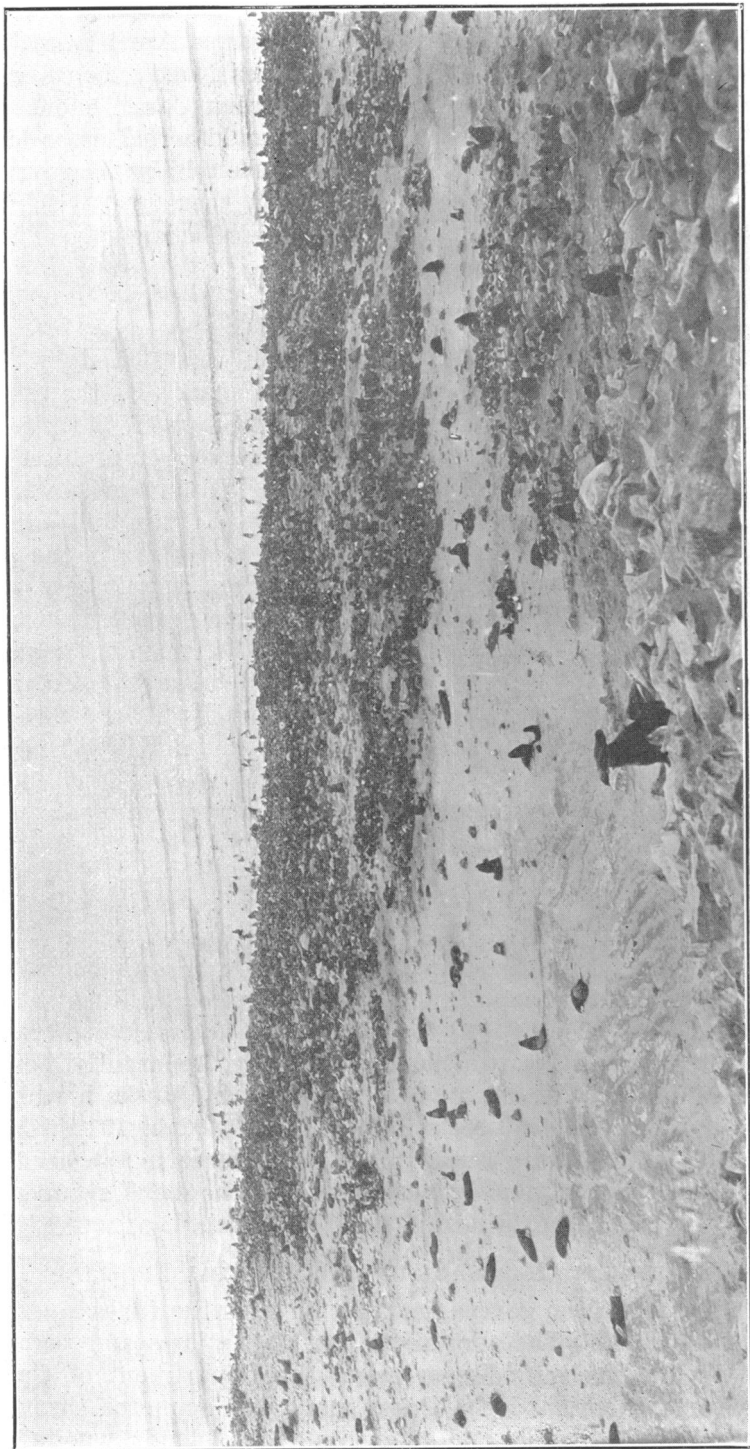
In the summer of 1911, a convention was signed by the United States, Great Britain, Russia and Japan. By the terms of this treaty, which became effective December 15, 1911, each of the four governments signatory thereto, agreed to prohibit its citizens from engaging in pelagic sealing. This provision also applies to the killing of sea otters. Great Britain and Japan thus gave up their right to kill seals and sea otters in the sea beyond the three-mile zone, a right which they undoubtedly possessed. In return for giving up this right, Great Britain and Japan are each to receive 15 per cent. of all the skins that may be taken on the land by the United States on the Pribilof Islands, and like percentage of those taken by Russia on her seal islands. In like manner Japan gives to the United States, Great Britain and Russia each 10 per cent. of the land catch from the small but growing herd under her jurisdiction.

#### CLOSE SEASON OF LAND KILLING

On August 24, 1912, Congress passed a law giving effect to the treaty of 1911, and, unfortunately, including at the same time a clause prohibiting all killing on the land for a period of five years. There was, therefore, no commercial killing of fur seals on our islands in 1913 to 1917, both inclusive. The terms of the treaty relating to pelagic sealing are, apparently, being observed and carried out in good faith, and the Alaska herd has increased from 127,000 seals in 1911 to 530,492 in 1918, when land killing was again resumed. This increase in the herd is most gratifying and shows clearly that the herd recovered rapidly upon the cessation of pelagic sealing.

#### GOVERNMENT HANDLING OF THE FUR-SEAL PROBLEM

In the main, the government has handled the fur-seal question fairly well. The administration of the laws and regulations by the Treasury Department, the Department of Commerce and Labor, and the Department of Commerce through the Bureau of Fisheries and its agents on the islands, was faith-



A TYPICAL FUR-SEAL ROOKERY. Note the large bulls scattered over the rookery and the surplus or waiting bulls in the foreground.

fully and intelligently conducted, at least up to the enactment of the close season law. However, several very serious mistakes have been made and it is to some of these that I now wish to call attention.

The most serious mistakes which the government has made have been: (1) Failure to realize that the fur-seal problem is, primarily, a biological problem; (2) disinclination to listen to the advise and council of scientific men; (3) failure to realize that preservation of the fur-seal herds requires the cooperation of several different countries.

Congress and the heads of the executive departments concerned seem wholly unable to realize that proper laws and regulations for the management and conservation of the fur-seal herd must be based upon accurate knowledge of the life history of the fur seal. Up to the time of the *modus vivendi* no study had ever been made of the life history of the fur-seal by any trained naturalist. It is true that many valuable observations were made in 1873-74, but they were in the main inconclusive; they were wholly so as to practically every fact of vital importance.

How to tell the age of seals in the different categories, the age at which the males and the females begin to breed, the period of virility of each, the age to which each lives, the proper size of the harem, to what extent the yearling males and females appear on the land, the migration routes, feeding habits and grounds, natural mortality, principal enemies;—these are but a few of the many questions which could not be definitely answered, because the facts were not known.

In drawing up the terms of the *modus vivendi*, the United States, because of its lack of knowledge on these essential matters, agreed to terms which afterward proved very embarrassing, and very detrimental to the herd. The British said: "We will stop killing seals in the eastern part of Bering Sea if you will stop killing on the land." And the United States stupidly agreed; with the result that, while the number killed on the land in those three years was 27,040, the number killed at sea was 238,349. Stopping commercial killing on the land simply left that many more for the pelagic sealers to get.

The *modus vivendi* was, therefore, a total failure as a protective measure, chiefly so because, through lack of accurate knowledge of the feeding habits of the fur seal, we agreed to terms that proved disastrous.

The same was true with the Treaty of 1892, the Paris Tribunal, and the Paris Tribunal Regulations. Many things were agreed to that were biological mistakes, because of our



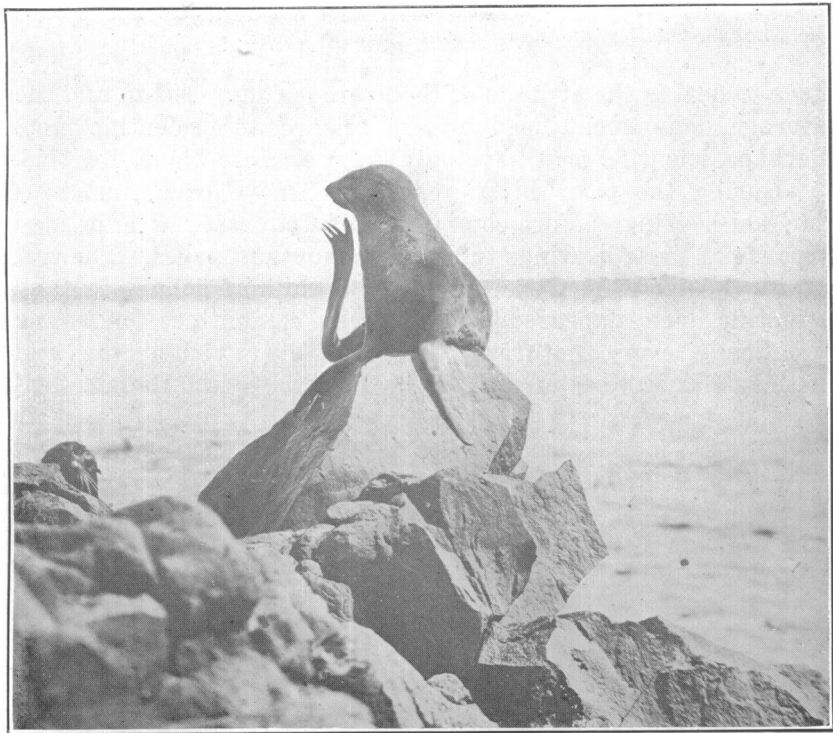
BREEDING BULL SEALS ON STARAYA ARTEL ROOKERY.  
St. George Island, July, 1916. Photo by Hanna.

lack of complete knowledge. True, our commissioners made certain proper statements before the Paris Tribunal, but when they were disputed by the British, we were unable to support our contentions with convincing evidence. We lacked full accurate data to support our claims.

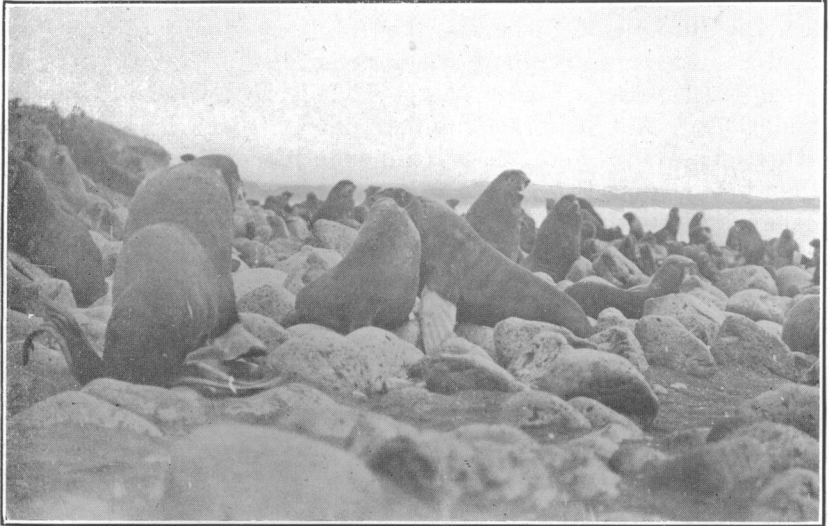
Naturalists many years ago began advising the government to provide for careful scientific study and supervision of the fur-seal herd. Our lack of knowledge of many of the essential facts in the life history of those interesting animals was pointed out again and again. The government was urged to place an energetic, resourceful, carefully trained naturalist in charge of the seal islands, with one or more trained assistants, so that the seals would be under careful scientific observation for a series of years. It was also urged that the naturalist to be put in charge should be a man who had some knowledge and experience in the raising and handling of domestic stock, because it was believed that the important principles of stock raising and management will be found to apply to the fur seal. This recommendation was made by the fur seal commissioners of 1891,

1892, 1896-97; by Captain Hooper of the Revenue Cutter service, the Bureau of Fisheries, the Advisory Board of the Fur Seal Service, and by many other naturalists. But it was not until 1910, when Charles Nagel was Secretary of Commerce and George M. Bowers Commissioner of Fisheries, that any attention was paid to this recommendation. A naturalist was then provided and serious, continued study of the fur seals was began and continued until Wm. C. Redfield became Secretary of Commerce. One of Mr. Redfield's first acts was to abolish the position of naturalist on the seal islands and to stop practically all natural history studies on the islands. Since 1913, the agents on the islands have been discouraged from making any study of the natural history of the islands; indeed, in one case at least, it is said that an agent who is a trained naturalist and who desired to carry on biological investigations and study of the seal and other animals of the islands, was ordered not to do so. (It is perhaps needless to say these orders were verbal; they were not put in writing.)

Perhaps the most discouraging condition with which we



FUR SEAL FANNING ITSELF ON A WARM DAY.  
Polovina rookery, St. Paul Island, August, 1917. Photo by Hanna.



BULLS FIGHTING ON ROOKERY ON ST. PAUL ISLAND, July, 1916. When there are more bulls than are needed for breeding purposes vicious fighting results in which breeding cows are injured, pups trampled to death, and great injury done to the rookeries. This is one of the deplorable results of the very unwise law of 1912 which prohibited the killing of the surplus males. Photo by Hanna.

have to deal is the attitude of the average congressman and the average department head toward science and scientific men. Perhaps scientific men have only themselves to blame for this.

During the past thirty years there have been numerous fur-seal hearings before committees of Congress. The printed records of these hearings total many thousand pages. The cost of the hearings has exceeded half a million dollars. Many scientific men appeared before these committees, including practically every naturalist who has ever visited the seal islands. They were unanimous in their views and their recommendations as to the questions at issue. Nevertheless, their views were rarely accepted by the partisan committees, and Secretary Redfield even penalized the officials in the Bureau of Fisheries who expressed views in harmony with those of the other naturalists who testified.

This lack on the part of congressmen and heads of government departments to appreciate science or scientific men is all too common. The scientific men who came in touch with government departments during the Great War know how true this is.

But, as I have said, perhaps the scientific men are themselves largely responsible for this attitude of our law makers and executives. If so, it is largely because of their extreme

modesty and dislike to enter into controversy with the powers that be.

The third serious mistake which our government made was its failure to realize that the fur-seal question is one that concerns a good many countries. In 1892 and 1893, our statesmen thought it concerned only the United States and Great Britain. Japan wanted to join the United States and Great Britain in the Treaty of 1892, but she was virtually told it was no concern of hers. Japan was thus left free to engage in pelagic sealing, and she promptly entered the field, with most disastrous results to the herd.

#### THE PARIS TRIBUNAL ALSO WAS A FAILURE

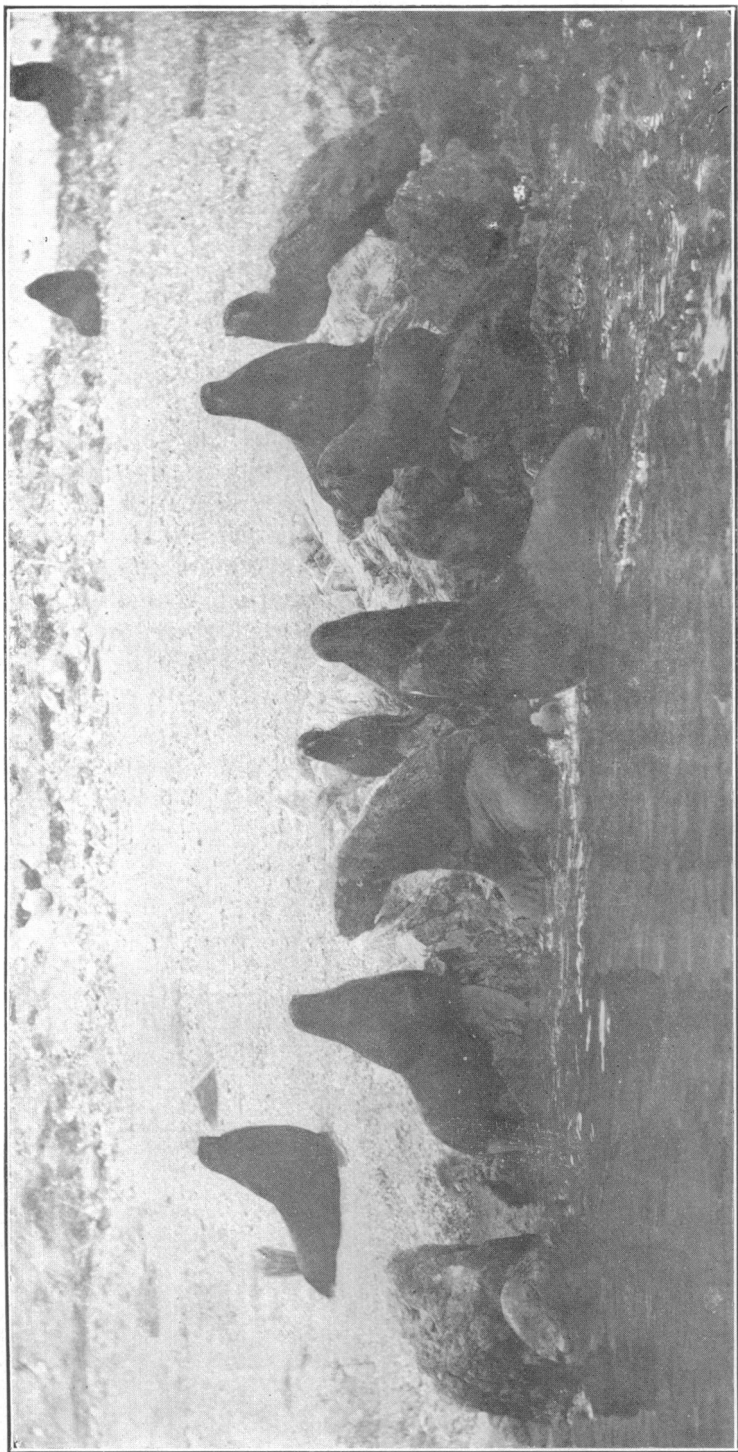
Before this tribunal the United States lost on every count of any importance. Naturalists and other experts had been called upon to supply data for the use of the commissioners and they did so, but were not permitted to be present in person and present the facts. The result was that when our commissioners and lawyers who possessed only information, instead of knowledge, concerning the fur seal, presented their case to the tribunal they were easily confounded by the British whose experts were at hand.

Our representatives were able men, to be sure, but through lack of scientific training and appreciation of science, they were not able to evaluate the biological data furnished them by



BACHELOR SEALS OR HOLLUSCHICKIE, being driven to the killing grounds.  
Photo by Chichester.





RUSSIAN FUR SEALS LANDING AT PALATA ROOKERY. Copper Island, June 4, 1892. Photo by Evermann.

the naturalists or to present the data logically and convincingly to the tribunal. The British were more wise because they depended more upon their naturalists.

The Paris Tribunal Regulations were an absolute failure for the same reason. Our representatives would not listen to the Americans who knew most about the habits of the fur seal and who were best able to advise them.

In this treaty of 1911 which abolished pelagic sealing, our commissioners were more successful. They were more successful because they more clearly appreciated the fact that the fur-seal question is primarily a scientific question, and they availed themselves of the services of the naturalists who were most familiar with the life history of the fur seal. These men were depended upon by our commissioners to a greater extent than ever before. The treaty is a good one. The serious mistake that was made was the failure to invite China, Mexico and several other countries to join in the treaty, as was urged by the naturalists. Who can say how long it will be before sealing schooners outfitted in China, Mexico, Peru or Chili, and flying the flags of those countries, may play havoc with our fur-seal herd? There is nothing to prevent them doing so; they have a perfect right to do so; and now that the herd has again grown to considerable size, the large profits from pelagic sealing are sure to appeal strongly to adventurous characters in those countries.

In short, Washington has not realized that the fur-seal problem is one which concerns or may concern every nation bordering on the Pacific.

The next and most inexcusable mistake of our government was made in the act approved August 24, 1912, giving effect to the treaty of 1911.

In that act two very unwise provisions were included. The first of these provided for a close season of five years (1912 to 1916) in which no commercial killing on the islands was permitted; the other provided that there shall be reserved for breeding purposes each year from 1917 to 1926, 5,000 young male seals.

As to the close season, it was not only unnecessary, it was actually harmful. There was already an excess of breeding males. To save all the males born each year is as absurd as it would be for a poultry raiser to save all the roosters that are hatched. The result has been that there are now several thousand more bulls than are needed for breeding purposes.

And the saving of 5,000 young bulls each year up to 1926, to grow up into breeding bulls will increase the number of breed-



A COW FUR SEAL AND HER PUP.

ing bulls enormously beyond the needs of the herd. The presence of surplus bulls about the rookeries always results in severe fighting, causing injury to the cows, tramping pups to death, and general demoralization of the harems. The census of 1918 disclosed more than 2,000 dead pups, most of which had been trampled to death.

There was only one man who had ever been to the seal islands who advocated a close season and the large reservation of males, and his purpose was *not* the preservation of the fur-seal herd. Every naturalist in America who was familiar with the habits of the fur seal strongly protested against both measures, as did also Hon. Charles Nagel, then Secretary of Commerce, and Hon. Geo. M. Bowers, Commissioner of Fisheries, but without avail. When Wm. C. Redfield became Secretary of Commerce, he was urged to recommend the repeal of those provisions of the law. But Mr. Redfield, when a member of Congress, had voted for the close season. And after becoming Secretary of Commerce, he had pronounced the "close season law as very wise and sound legislation for the protection of our seal herds." However, on May 26, 1914, he appointed a commission of three eminent naturalists to visit the seal islands. The men appointed were selected "because, not having previously been identified with, or in any way concerned with fur seals or the fur-seal controversy," and it was expected that their "observations and conclusions would be uninfluenced by the past contentions." Their main duty was "to ascertain the actual state of the herd in 1914," and to submit to the Secretary of Commerce upon their return "recommendations touching all important administrative matters growing out of the international, economic, and biological relations of the seal herd," and especially regarding "the strength of the surplus male life in relation to the close-time provisions of existing law and to treaty obligation."

Before proceeding to the islands, these naturalists were warned not to talk with any one who had ever visited the seal islands or who had any personal knowledge of fur seals. They were, however, very diplomatically made acquainted with the views of the secretary; that he had voted for the close season law, that he was on record as saying that that law was "very wise and sound legislation for the protection of our seal herds," He had already taken positive stand on the matter and apparently believed that his special commissioners, knowing his position, would be accommodating and sustain him in his views.

But these three able naturalists were not of the type of men with which politicians usually deal. They were investigators.

The secretary did not know that scientific men search for truth and, when found, proclaim it. These men went to the seal islands seeking truth. They made their investigations and, upon their return, promptly submitted their report. They found that the close-season law, instead of being "wise and sound legislation" was just the opposite, and *unanimously recommended its immediate repeal!*

Although the report was received by the secretary in ample time for him to have gotten action, he pigeon-holed the report and did not transmit it to Congress until February 17, only a few days before Congress adjourned. And when he did transmit the report to Congress, he studiously avoided calling attention to any of the recommendations made by the investigators and refrained from making any recommendations of his own, although his letter of transmittal contains 600 words!

The close-season law had already been in force two years and had already caused a loss of more than a million dollars to the government and great injury to the herd. But the secretary contemptuously ignored the recommendations of experts of his own choosing and permitted the pernicious law to run its disastrous course. There were already many more bulls than were needed for breeding purposes. Thousands of pups were being trampled to death every year. The actual money loss to the United States has exceeded \$3,000,000, to say nothing of the injury to the herd; and the loss to Great Britain and Japan has been at least \$450,000 each.

But it is hoped and believed that, as one of the results of the world war, law makers and executives will hereafter be more appreciative of science and scientific men. No question is settled until it is settled right. This is no more true of any question than it is of those questions which relate to biological science. There are many such questions or problems in marine zoology. The fur-seal problem is only one of them. The walrus, the sea otter, the several species of sea lions and hair seals including the elephant seal, the whales and the porpoises, all these are animals that spend all or at least part of their lives beyond the three-mile limit. Our knowledge of not one of these interesting animals is such as is necessary to enable us to make proper laws and regulations for its maximum utilization consistent with the adequate conservation of the species. As they are found beyond the three-mile zone, they are subjects for international study and regulation. The same is true of all the important fisheries, such as the cod, halibut, herring, salmon, tuna and many others.